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(54) **JUNCTION-LESS INSULATED GATE CURRENT LIMITER DEVICE**

(71) Applicant: **Fairchild Semiconductor Corporation**, San Jose, CA (US)

(72) Inventors: **Tirthajyoti Sarkar**, Pune (IN); **Adrian Mikolajczak**, Los Altos, CA (US); **Ihsiu Ho**, Salt Lake City, UT (US); **Ashok Challa**, San Jose, CA (US)

(73) Assignee: **Fairchild Semiconductor Corporation**, San Jose, CA (US)

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(58) **Field of Classification Search**
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Primary Examiner — Stephen W Jackson
(74) *Attorney, Agent, or Firm* — Brake Hughes Bellermann LLP

(57) **ABSTRACT**

In one general aspect, an apparatus can include a semiconductor substrate, and a trench defined within the semiconductor substrate and having a depth aligned along a vertical axis, a length aligned along a longitudinal axis, and a width aligned along a horizontal axis. The apparatus includes a dielectric disposed within the trench, and an electrode disposed within the dielectric and insulated from the semiconductor substrate by the dielectric. The semiconductor substrate can have a portion aligned vertically and adjacent the trench, and the portion of the semiconductor substrate can have a conductivity type that is continuous along an entirety of the depth of the trench. The apparatus is biased to a normally-on state.

20 Claims, 16 Drawing Sheets